Designing a resource plan for the NYPD

Jackson Au

Crime is prevalent in New York!

New York has steady cases of crime.

This is something the New York Police Department is constantly trying to lower over the years.

Rate of Crime per 100,000 people	
Year	**Crime Cases**
2014	2,101.8
2015	1,986.8
2016	1.921.8
2017	1.858.7
2018	1.791.0

PROBLEM STATEMENT

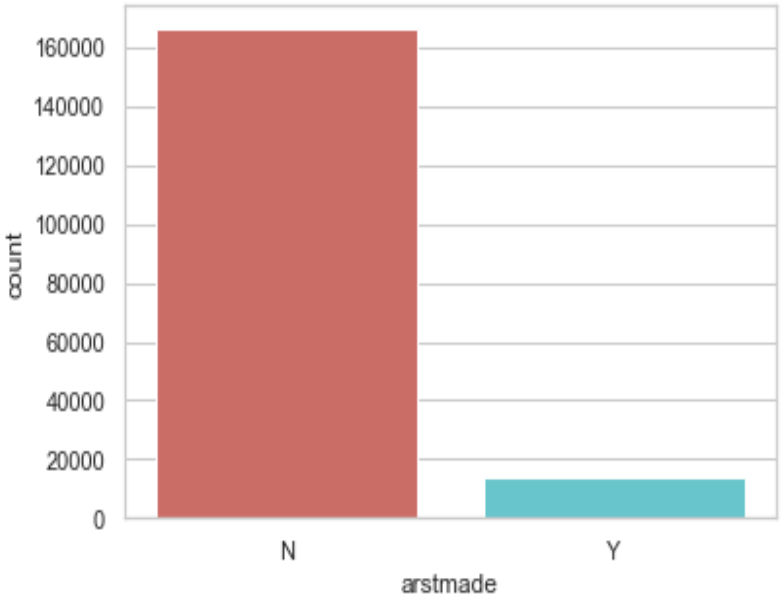
Though 2,000 cases per 100,000 people may seem small. We must remember New York is a **populated** state (19 million people). At a 2% crime rate, that is nearly **half a million** crime cases annually!

Using historical data, can we help the NYPD become more proactive and efficient?

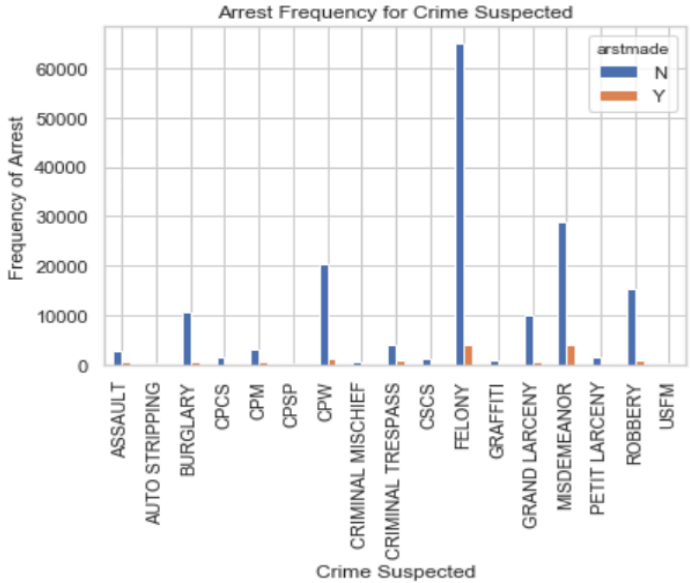
Data utilized

- NYPD Stop, Question and Frisk Data (NYC.gov)

Exploratory Data Analysis

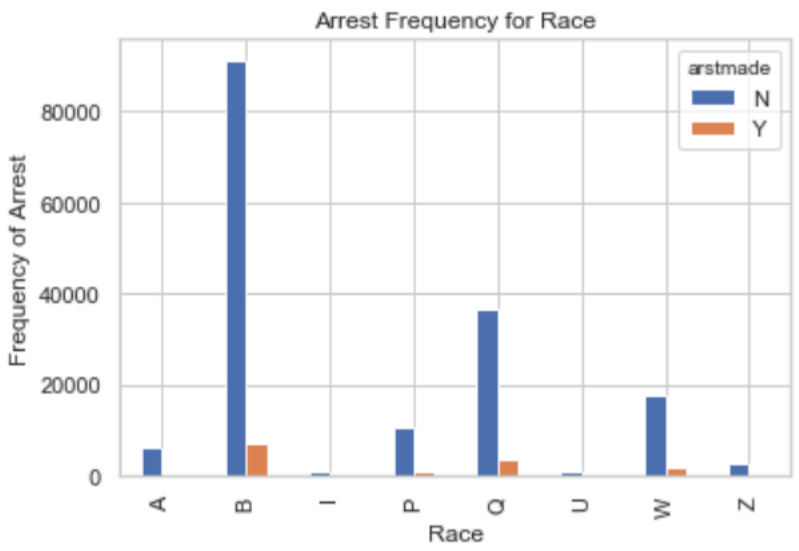


*NYPD **only** arrested **7%** of people they stopped*

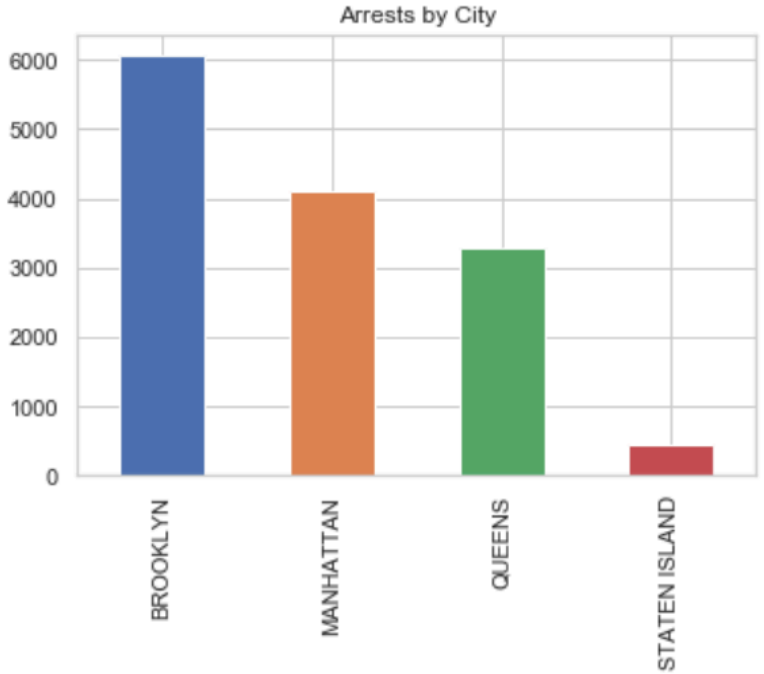


Certain crimes did NOT lead to arrests

Exploratory Data Analysis (continued)



Race does seem to play a role in arrest decisions

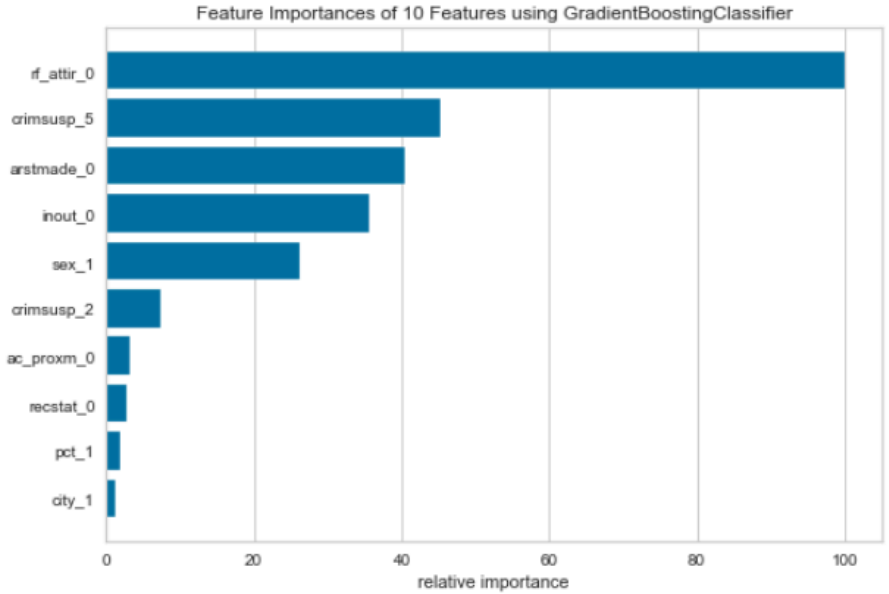


*Seems **Brooklyn** will require additional staffing versus **Staten Island***

Modeling

MODEL	F-Measure
Linear Regression	.66
Random Forest	.67
K-Nearest Neighbors	.60

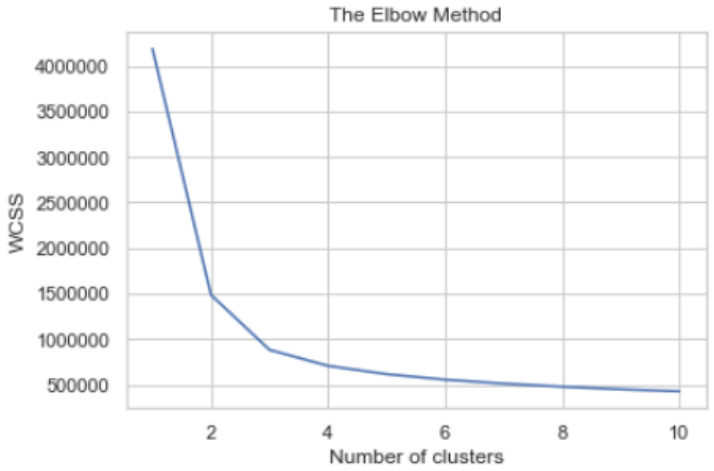
Classification model performance



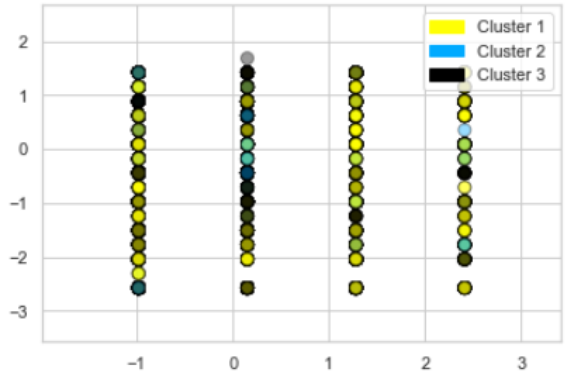
Gradient Boosting to discover top 10 features in model

Clustering

Cluster analysis segments data into groups, so the NYPD understands what criminal “profiles” can look like.



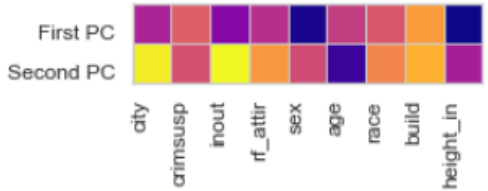
Within-Cluster Sum of Squares suggests we use 3 clusters

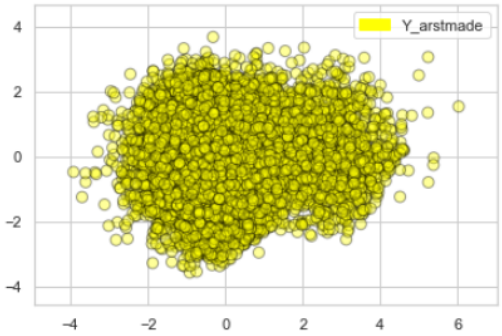


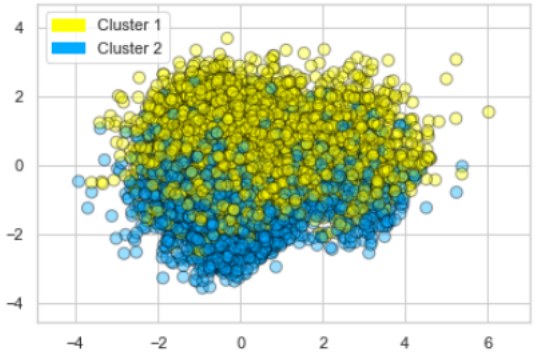
Cluster 1 – 59% of data
- 29 y/o, male, Queens residents
Cluster 2 – 8% of data
- 29 y/o, male, Brooklyn & Manhattan residents
Cluster 3 – 33% of data
- 32 y/o, female, Manhattan

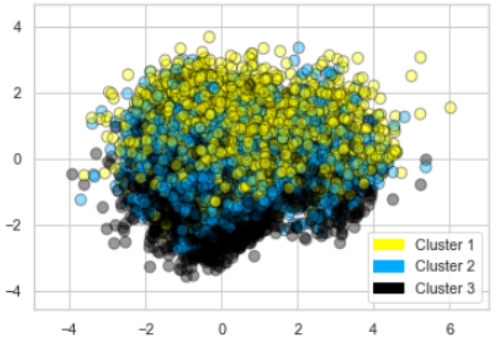
Principal Component Analysis

I use dimension reduction technique, PCA, to summarize features in the data.









FINAL CONCLUSIONS

Let's sum up the matter with some final conclusions about the presentation.

Recommendation

Allocate more police force in Brooklyn and Queens. Focus on crimes with higher arrest rate (felony).

Important Features

Attire and suspected crime are huge red flags to look out for in potential criminals

Ethics

Information should remain private and kept for internal-use only.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Thank you!